ALTERNATIVE ANALYSIS FOR WORK WITHIN A RIVERFRONT AREA

67 Chace Road

FREETOWN, MA

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Revised February 2022

In evaluating the proposed work within the riverfront resource area under the limited access provision, a consideration was given to other potential access routes that could obviate the need for the resource disturbance; potential access routes that would minimize any impact on wildlife; potential access routes that would be less intrusive on the resource; and economic impact analysis.

In accordance with 310 CMR 10.53(3)(d), the construction, operation, and maintenance of an underground or overhead public utility such as electrical distribution or transmission lines may be permitted as a limited project. The interconnection route (described below) and portions of the proposed solar array site work are located within the riverfront area.

The interconnection route shown is necessary to allow the connection of the individual proposed photovoltaic panel areas to the existing power grid out at Chace Road. Power will be brought along the length of the interconnection route via overhead wires mounted on wooded utility poles bored into the ground at approximate 150 foot intervals. The interconnection route within the limits of the riverfront area will be within the existing cart paths that run across the site as well as within the solar arrays themselves. The area required for utility pole installations is generally limited to within a foot radially from the 10- inch diameter of the utility poles to be augured into the soil. The choice to utilize overhead wires within the vicinity of the resource areas limits the potential impacts to the wetlands resources as opposed to the installation of underground conduits. Additionally, the existing dirt cart path will be improved with a dense graded gravel mix to reduce the sediments within the runoff which currently exists at the site due to normal use of the cart path by vehicles.

There are no state listed wildlife habitats or rare and endangered species habitat that would be affected by the proposed work within the riverfront area and wetland buffer zone.

The proposed work within the riverfront area is within the allowable threshold of 5000 S.F. or ten percent of the riverfront area whichever is greater. Specifically, 5.9% of the 54.6 acres of riverfront area on site are proposed to be included within the limit of work- nearly 100% of this work is associated with the stabilization of the existing cart path. Solar array development for harnessing solar energy is an allowed use within the town's zoning bylaws for the locus. Other

uses, including agricultural farming, single family residential development and multifamily residential development are allowed uses in the district.

No Build- Agricultural Use

The property currently supports active cranberry growing within the existing cranberry bogs and sand and gravel mining operations. The use of fertilizers and pesticides increases the potential for increased nutrient loading and contamination of the waters tributary to Fall Brook (a Zone-A tributary). The sand and gravel mining operations strip all vegetation and remove soils from the site. The transport of sand and gravel by trucks and the loss of vegetation allow greater amounts of total suspended solids to potentially enter the area waterways via runoff from the cart paths and exposed bare soil areas.

Residential Development

The applicant/owner has evaluated the site for residential development. Based on the zoning bylaws, the site could potentially support the development of approximately thirty (30) residential units. With an average bedroom count of three bedrooms per unit, the number of bedrooms that could be developed on-site will be 90. Whereas public sanitary sewer collection and conveyance system is not available for tie-in of site-generated sanitary waste water flow, on-site waste water disposal system(s) would have to be developed for the potential thirty residential units. Based on 110 gpd/bedroom pursuant to 310 CMR 15, the 90 bedrooms would generate 3,300 gpd of sanitary wastewater that could impair groundwater. Domestic water supply via municipal water system or on-site potable water well development will be necessary. The residential units will also involve the construction of several driveways and access roadways, thereby generating surface water runoff-borne pollutants that could increase pollution loading to Zone A tributary streams and wetlands. Although stormwater would be filtered through state approved best management (BMP) infiltration/ detention systems, the quality of the water entering these BMPs is degraded. As storm water flows over paved surfaces, the water picks up dirt and dust, rubber and metal deposits from tire wear, antifreeze and engine oil that has dripped onto the pavement, pesticides and fertilizers, and discarded cups, plastic bags, cigarette butts, pet waste, and other litter. Other pollutants such as heavy metals and pesticides adhere to sediment and are transported with it by wind and water. These pollutants degrade water quality and can harm aquatic life by interfering with photosynthesis, respiration, growth, and reproduction.

Heavy Metals: Heavy metals come from some "natural" sources such as minerals in rocks, vegetation, sand, and salt. But they also come from car and truck exhaust, worn tires and engine parts, brake linings, weathered paint, and rust. Heavy metals are toxic to aquatic life and can potentially contaminate ground water.

Debris: Grass and shrub clippings, pet waste, food containers, and other household wastes and litter can lead to unsightly and polluted waters. Pet waste from urban areas can add nutrients and cause eutrophication.

Road salts can be a major pollutant in urban areas. Snow runoff containing salt can produce high sodium and chloride concentrations. This can cause unnecessary fish kills and changes to water chemistry.

Fertilizers, Pesticides, and Herbicides: If these are applied excessively or improperly, fertilizers, pesticides, and herbicides can be carried by rain waters from the green parts of public rights-of-way. Fertilizers contribute to algal blooms and excessive plant growth, and can lead to eutrophication. Pesticides and herbicides can be harmful to human and aquatic life.

Solar Development

A solar development will impact forest habitat similar to residential development but eliminates the pollution loading by the existing cranberry operation and potential pollution created by residential development.

A solar development will convert forested land to grass land habitat. Proposed maintenance of the solar field will include several wildlife friendly practices including late season dependent mowing and 6-inch opening along the base of the fencing to allow wildlife movement. Mowing of the areas between the panels and mowing or hand weed whacking under the panels will be limited between November 1st to March 1st. The base of the fencing will be constructed 6 inches above the ground surface to allow wildlife movement of small mammals and reptiles. This allows the solar field to provide wildlife utilization of the grass land habitat, a limited habitat in eastern Massachusetts. Additional environmentally target practices include no lighting, and no use of herbicide or pesticides within the facility.

The solar arrays are considered impervious surfaces. Rain and snow melt water is a clean source of groundwater compared to runoff from residential roadways. The runoff from the drip edge of the panels will enter flow across the ground surface and then infiltrate into the soil and/or enter stormwater detention basins. The proposed development design infiltrates 100% of the storm related runoff from the developed areas.

The proposed solar array development makes most environmental sense, and would obviate the need for a domestic water supply source development, and eliminate the potential for groundwater pollution and impairment from on-site waste water disposal system(s) and roadway stormwater BMPs.

In evaluating the proposed work within the riverfront area of the project locus, a economic consideration was given to other potential alternatives for the riverfront area. However, given the limited extent of disturbance, there are five (5) other alternative uses that are potentially viable for the site: 1, "Do nothing and leave the site in its natural state"; 2, agricultural use, 3, continued sand and gravel mining operations, 4, residential subdivision, and 5, reduced size development of a solar farm. The "Do nothing and leave the site in its natural state" alternative is not a viable option because of its economic impact in lost revenue to the applicant/owner. The agricultural use is not a desirable use because the current economic environment for the sale of cranberries is unfavorable for small cranberry growing farmers and construction of new bogs within the upland areas is cost prohibitive. If additional cranberry bog areas were to be constructed, it would involve a more substantial disturbance and displacement of the riverfront area and would pose a higher on-going environmental pollution risk that could be engendered by the application of large quantities of fertilizer and pesticides. Additionally, the operation of sand and gravel mining is not preferable as the vegetation is entirely stripped from the landscape leaving barren nutrient poor sand and gravel surfaces which are highly erodible. The residential subdivision is not feasible due to significant economic costs associated with road construction and engineering to generate the appropriate lot frontage requirements. In addition, to access and utilize the large areas of uplands, a wider roadway would be required to cross Fall Brook at multiple locations and portions of the existing wetland resource areas would need to be filled. Additionally, the larger area for road construction would necessitate additional tree clearing along portions of the inner riverfront area. The development of a solar farm for which the solar panels are entirely outside of the riverfront area is proposed.

Due to the shape of the land boundaries and the location of the riverfront area, access roadways and the interconnection route would still be required within the riverfront area to be able to access each portion of the site. The development of a solar field option, as proposed, is chosen based upon its smaller wetland resource impacts, the potential revenue to the applicant/owner, as well as the additional clean renewable energy supplied to the public utility grid for use by the Town of Freetown residents. The installation of clean energy will result in a grassland habitat containing the solar panel arrays as opposed to a sand and gravel stripped landscape devoid of vegetation for years into the future or a residential neighborhood where manicured lawns and paved surfaces produce no useful wildlife habitat. The selected array development employs latest technology in power capturing, conversion and transmission, requiring less hardware and achieving a cost reduction of approximately fifteen (15) percent over previous technology. Furthermore, with an alternative residential development of approximately thirty (30) homes, a higher cost of eighteen (18) million dollars would be involved, versus the proposed solar array development that would cost roughly eleven (11) to twelve (12) million dollars. The financial benefit of the solar array development over a residential development is seen in the long-term cost impact to the community with respect to public safety cost, education cost of school age children, even if only fifty (50) percent of the residential homes had school age children in them.

Conversely, the tax revenue benefitting the Town of Freetown for the solar array installation can be expected to add millions of dollars over the life of the project to the Town's account.